UNIVERSITI PUTRA MALAYSIA

LOW INTENSITY TAPPING SYSTEMS AND STIMULATION PRACTICES AFFECTING IN HEVEA BRASILIENSIS (MUELL.ARG.)

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LOW INTENSITY TAPPING SYSTEMS AND STIMULATION PRACTICES AFFECTING RESPONSES IN *HEVEA BRASILIENSIS* (MUELL. ARG.)

by

ISMAIL BIN HASHIM

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LIST OF ABBREVIATIONS

a.i.	active ingredient
AVROS	Algemene Vereniging Rubber Oostkust Sumatra
B-serum	Bottom fraction serum
Beta coefficient	Standardized regression coefficient
Ca	Calcium
CoA	Coenzyme A
CUT	Controlled Upward Tapping
CV	covariance
d.r.c.	dry rubber content
ET	ethephon
f.o.b.	freight on board
g/t/t	gram per tree per tapping
GT	Gondang Tapen (Indonesia)
IRCA	Institut de Recherches sur le Caoutchouc
IRRDB	International Rubber Research and Development Board
IPP	isopentenyl pyrophosphate
kg/ha	kilogram per hectare
MAPA	Malaysian Agricultural Producers' Association
Mg	Magnesium
MVA	Mevalonic acid

NUPW	National Union of Plantation Workers
NPK	Nitrogen, Phosphorus, Potassium
NR	natural rubber
P	Phosphorus
pH	power of Hydrogen
PI	plugging index
PR	Proefstation voor Rubber (Indonesia)
PRI	plasticity retention index
R & D	research and development
SMR	Standard Malaysian Rubber
TP	Turgor pressure
U-gouge	end of blade is U-shaped
V-shape	end of blade is V-shaped
2,4-D	2,4-dichloro phenoxyacetic acid
2,4,5-T	2,4,5-trichloro phenoxyacetic acid

ABSTRACT

An abstract of the thesis presented to the Senate of Universiti Pertanian Malaysia in partial fulfilment of the requirements for the Degree of Doctor of Philosophy.

LOW INTENSITY TAPPING SYSTEMS AND STIMULATION PRACTICES AFFECTING RESPONSES IN HEVEA BRASILIENSIS (MUELL. ARG.)

by

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The natural rubber industry in Malaysia is experiencing serious problems of high production costs and increasing shortage of skilled tappers. Thus there is a pressing need to evolve suitable tapping systems to resolve these problems. With this objective in mind, the suitability of various less labour-intensive low-intensity tapping systems and stimulation practices are evaluated in this study.

The tapping systems included are the half-spiral fourth-daily system (1/2S d/4), suitable for estates, and the quarter-spiral alternate-daily change-over system (1/4S d/2(t,t)) suitable for smallholders; with various levels of ethephon stimulation. The conventional half-spiral alternate-daily tapping system (1/2S d/2) was included as control. Altogether, three groups of trials comprising a series of long-term preliminary trials, a series of main field trials and a trial on exploitation physiology and anatomy were conducted.

In a series of long-term preliminary experiments, the 1/2S d/4 and the 1/4S d/2(t,t) systems with stimulation have shown promising results on both the basal and high panels of some selected cultivars. These systems have given uniform and sustained yields, higher dry rubber content, low late drip, low dryness incidence, low bark consumption and better girthing than the 1/2S d/2 control. Some parameters on stimulation practices were also established for evaluation in the main field trials.

Evaluation of low intensity systems and stimulation practices on clones PB 255, RRIM 712, PR 255 and RRIM 600 carried out under main field trials confirmed the beneficial features of these systems on base panel BO-1. This also holds true for other panels on clone RRIM 600. Although the 1/2S d/2 systems were most profitable during the two years of observation, the low intensity tapping systems showed a rising yield trend with good secondary characteristics.